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Armed Conflicts in Outer Space: Applicability and Challenges of International Humanitarian Law

Conflictos armados en el espacio ultraterrestre: aplicación y retos del Derecho Internacional Humanitario

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Abstract

The paper critically explores those scenarios (hypothetical, but probable) in which armed conflicts take place in outer space. First, the problem regarding the definition and delimitation of outer space will be analyzed. In this regard, the reasons why there is no consensus among the States, and even within the scientific community, will be explained. Subsequently, the relevant branches (for the topic) of Public International Law will be introduced (International Space Law, International Humanitarian Law, and *Ius ad Bellum*) and their key regulations will be identified. At this point, the main reasons why International Humanitarian Law shall be applied in the event that an armed conflict develops in outer space will be explained taking into account PIL formal and auxiliary sources. Likewise, specific challenges, that result from the application of International Humanitarian Law in outer space, will be exposed and analyzed. These challenges include: (i) attacks on dual-use objects; (ii) the obligations of the parties to the conflict when there is human direct or physical participation; and (iii) the applicable regulations for the development and use of new weapons. For each problem raised, possible solutions based on the rules and principles of current law will be provided. Finally, the need for the eventual creation of a specific treaty to regulate the matter will be emphasized, in view of the unique nature of this type of conflict.

Keywords

International Humanitarian Law; Space Law; Outer Space; applicability; challenges; Kármán line; direct participation; new weapons; dual use objects; diligence standards

Resumen

El artículo explora de forma crítica aquellos escenarios (hipotéticos, pero probables) en los que conflictos armados se desarrollan en el espacio ultraterrestre. En primer lugar, se analizará el problema relativo a la definición y delimitación del espacio ultraterrestre. Al respecto, se expondrán las razones por las que no existe un consenso entre los Estados e, inclusive, dentro de la comunidad científica. Posteriormente, se introducirán las ramas del Derecho Internacional Público relevantes en la materia (Derecho Internacional Espacial, Derecho Internacional Humanitario y Ius ad Bellum) y se identificarán normas clave. En este punto, se expondrán las principales razones, basadas en fuentes formales y auxiliares del DIP, por las que el Derecho Internacional Humanitario debe ser aplicado en caso de que un conflicto armado se desarrollase en el espacio ultraterrestre. De igual manera, se expondrán y analizarán retos concretos que la aplicación del DIH en el espacio ultraterrestre podría suponer en relación con la posibilidad de: (i) ataques a objetos de uso dual; (ii) las obligaciones de las partes del conflicto cuando existe participación humana directa o física en el espacio; y, (iii) las normas aplicables para el desarrollo y uso de armas nuevas. Para cada problema planteado se proporcionarán posibles

soluciones basadas las normas y principios del derecho existente. Finalmente, se enfatizará en la necesidad de la eventual creación de un tratado específico que regule la materia, en vista de la naturaleza única de este tipo de conflictos.

Palabras Clave
Derecho Internacional Humanitario; Derecho Internacional Espacial; espacio ultraterrestre; aplicabilidad; retos; línea Kármán; participación directa; nuevas armas; objetos de uso dual; estándares de diligencia

1. Introduction

"All armies prefer high ground to low and sunny places to dark."
Sun Tzu. The Art of War, Chapter IX, 11.

The classic films of the 20th century, such as Star Wars and Star Trek, do not seem like entire science fiction anymore. In fact, the space programs of the U.S., China, Russia, among others, have developed to the point that spaceships are a reality and space warfare is plausible nowadays. For instance, in 2012, the U.S. launched a military space plane known as the X-37B; the plane spent 674 days in outer space and was part of a joint project between NASA and the Defense Department of the U.S.[1]. Since the return of the aircraft in 2014, there have been many speculations about the real purpose of the X-37B; despite the fact that most of the information remains classified, the experts agree that the test contributed to the development of critical technologies related with the eventual weaponization of the outer space[2]. It is remarkable that the U.S. has expressed how important they consider space warfare since the beginning of the Cold War. For example, in 2005 General Lance Lord[3] proclaimed: "Space superiority is the future of warfare. We cannot win a war without controlling the high ground, and the high ground is space"[4].

In the same context, the U.S. Defense Intelligence Agency considers that China and Russia could represent threats due to their technological capacity, and their view of the space as "important to the modern warfare"[5]. Indeed, China has stated: "To explore the vast cosmos, develop the space industry, and build

1 Ghoshroy, Subrata. "The X-37B: Backdoor weaponization of space?". *Bulletin of the Atomic Scientists*. Vol 71:3 (2015), p. 21.
2 *Id.*, p. 19.
3 According to the U.S. Air Force, General Lance Lord (who retired in 2006) was responsible for the "development, acquisition and operation of the Air Force's space and missile systems". Additionally, Lord ensured the "combat readiness of America's intercontinental ballistic missile force". See more at: U.S. Air Force. *General Lace. W. Lord*, 2006. https://www.af.mil/AboutUs/Biographies/Display/Article/105049/general-lance-w-lord/ (access: 03/01/2020).
4 General Lord, Lance W. "Space Superiority". *High Frontier. The Journal for Space and Missile Professionals*. Volume 1, Number 3 (Winter 2005), p. 4.
5 U.S. Defense Intelligence Agency. *Challenges to Security in Space*, 2019, p. 3. https://fas.org/spp/military/program/asat/dia-challenges.pdf (access: 07/01/2020).

China into a **space power** is a dream we pursue unremittingly" (emphasis added)[6]. China's military capacity in outer space includes 4 communication satellites destined for military purposes[7], projects involving laser weapons that could destroy or damage satellites[8], a variated range of space launch vehicles (primarily the LM series)[9], etc. In fact, in 2007, China tested a direct-ascent Anti-satellite weapon (hereinafter ASAT) that destroyed one of their weather satellites and demonstrated that space weapons are already at their disposal[10].

In the case of Russia, the facts are very similar; the Russian arsenal includes a wide range of space launch vehicles (including the Soyuz and Zenit series)[11], ASAT laser weapons, mobile missile systems capable to destroy pace targets, etc.[12] Despite of the fact that the number of States that count with strong military space programs is limited, countries such as Iran, North Korea, South Korea and Israel have demonstrated certain military capacities that could produce an impact in space warfare. In consequence, the aforementioned States shall be considered probable actors in a hypothetical armed conflict in outer space[13].

The facts demonstrate that the weaponization of the space is a reality that cannot be omitted. Just as the arms race of the end of the 19th century and the beginning of the 20th century brought as a consequence the Great War, it would not be naïve to think about a real possibility of facing armed conflicts in outer space. In that case, it would be inconceivable to think that the hostilities could develop without any regulation in this scenario. Consequently, many questions arise regarding the law applicable to armed conflicts that could take place in outer space. Even though International Space Law, in complement with International Humanitarian Law (onwards IHL), seem to be the appropriate branches of law to regulate these situations, there is a gigantic gray area. As will be demonstrated, the application of IHL in outer space would represent a lot of challenges that would be very difficult to face with the current state of development of law.

This article will explore this concern starting from very basic concepts such as Outer Space and its possible delimitation, Space Law, and International

6 The State Council of the People's Republic Of China. *Full text of white paper on China's space activities in 2016,* 2016. http://english.www.gov.cn/archive/white_paper/2016/12/28/content_281475527159496.htm (access: 07/01/2020).

7 Union of Concerned Scientists. *Satellite Database*, 2005-2019. https://www.ucsusa.org/nuclear-weapons/space-weapons/satellite-database (access: 12/01/2020).

8 Ying, Li; Bingyu, Zhou. "Ground High Power Laser Anti-Satellite Reconnaissance Technology," *Guangdian Duikang yu Wuyuan Ganrao [Optoelectronic Warfare and Passive Jamming]*, No. 2 (2002), pp. 9–12.

9 U.S. Defense Intelligence Agency. *Challenges to Security in Space*, 2019, p. 16. https://fas.org/spp/military/program/asat/dia-challenges.pdf (access: 07/01/2020).

10 Foust, Jeff. *U.S. Dismisses Space Weapons Treaty Proposal As "Fundamentally Flawed",* 2014. https://spacenews.com/41842us-dismisses-space-weapons-treaty-proposal-as-fundamentally-flawed/ (access: 19/01/2020).

11 U.S. Defense Intelligence Agency. *Challenges to Security in Space*, 2019, p. 25. https://fas.org/spp/military/program/asat/dia-challenges.pdf (access: 07/01/2020).

12 *Id.*, p. 29.

13 The weapons referred by each country are mere examples of their military capacity and are not by any mean exhaustive. The objective of their employment in this introductory section is just to contextualize the current global weaponized scenario.

Humanitarian Law. Later, the legal framework applicable to the scenario of the armed conflicts in outer space will be analyzed. Then, some challenges of the possible application of IHL will be addressed, including concerns about dual-use objects, human direct participation, and the development of new weapons. Finally, the necessity of a new treaty will be considered, as well as some initiatives to regulate this area with non-binding instruments will be referred to[14].

2. Definitions

2.1. Outer Space

It is fundamental to determine the territorial or physical scope of application of the different law frames that will be analyzed in this paper. Therefore, outer space must be conceptualized. An ordinary definition of outer space might be: "the area outside the earth's atmosphere where the other planets and stars are situated"[15]. As can be concluded by the simple lecture of the provided definition, the conventional concept may be considered vague and insufficient as it does not include precise limits of outer space.

Unfortunately, this term is not expressly delimited or delineated by treaty law. Furthermore, there is not even agreement within the scientific community. However, the most common reference used to determine the commencement of space is known as the Kármán Line, an imaginary boundary situated 100 kilometers (62 miles) above sea level[16]. This measure is used by the *Fédération Aéronautique Internationale* (FAI) and many other organizations[17]. The explanation of delimiting space with the Kármán Line is:

> In theory, once this 100 km line is crossed, the atmosphere becomes too thin to provide enough lift for conventional aircraft to maintain flight. At this altitude, a conventional plane would need to reach orbital velocity or risk falling back to Earth[18].

14 This article focuses on scenarios of International Armed Conflicts (IACs). The challenges that may arise in regard to Non-International Armed Conflicts (NIACs) are very different not only because of the nature of the conflict but also due to the applicable law available. Therefore, space warfare in NIACs is not going to be addressed with profundity; it may be a topic for a future investigation.

15 COBUILD Advanced English Dictionary. *Outer Space*, N.d. https://www.collinsdictionary.com/dictionary/english/outer-space (access: 13/03/2020). The term "outer space" started to be used in its current sense since the 1800s. Statistics reveal that the term became extremely common during the second half of the 20th century (at the time when the Cold War took place); the peak of frequency of the term "outer space" is situated in 1984 and 1987 with records of frequency of 0.42 and 0.43 respectively. To see more visit the previously cited site.

16 National Oceanic and Atmospheric Administration. *Space. It's the final frontier and also happens to be where NOAA operates the Nation's environmental and meteorological satellites. But where is "space" exactly,* 2016, par. 5. https://www.nesdis.noaa.gov/content/where-space (access: 24/01/2020).

17 *Ibíd*.

18 *Id*., par. 4.

Beyond theoretical discussions, States have adopted functional approaches considering aerodynamic parameters[19]. In this context, for the United States: "terrestrial-based forces generally operate below an altitude of roughly 100 kilometers, whereas spaced-based forces operate above this altitude where the effects of drag and lift are negligible"[20]. In the case of the United Kingdom, the beginning of outer space is not that clear because it would depend on the technology available. Indeed, the U.K. maintains that the extent of the airspace may vary, but for practical purposes: "the upper limit to a state's rights in airspace is above the highest altitude at which an aircraft can fly and below the lowest possible perigee of an earth satellite in orbit"[21].

The aim to reach a consensus between the international community regarding the definition and delimitation of the outer space has been present since 1966 via the Legal Subcommittee (hereinafter Legal Subcommittee) of the UN Committee on the Peaceful Uses of Outer Space[22]. The reality is that this organ has not been able to reach an agreement in more than 50 years. In such a long time, the debate within the Subcommittee has focused on technical and scientific endless discussions. Furthermore, at some point between 1979 and 1982, the debate took a drastic turn in order to discuss the necessity of developing a definition and delimitation of outer space[23]. The fact that the institutions have not been able to properly address this issue, plus the lack of will of the States, leads us to the conclusion that the goal to define and delimit outer space in a binding instrument is far to be materialized.

At this point, the following question would normally arise: Is it a matter of such great importance to delimit outer space in a binding instrument? The answer is undoubtedly affirmative. Some of the reasons have been provided by those States that participated in the fifty-eight session of the Legal Subcommittee in 2019; in summary, the delimitation of outer space would:

a. Reduce uncertainty regarding the applicability of space law and aeronautical law.
b. Facilitate the national implementation of international space and aeronautical law.

19 Schmitt, Michael N. "International Law and Operations in Space". *Max Planck Yearbook of the United Nations Law*. Volume 10 (2006), p. 99.

20 United States Air Force. *Space Operations, Doctrine Document 2-2*, 2001, pp. 33-34. http://usafaspace.tripod.com/other/AFDD_2_2_11_01.pdf (access: 27/01/2020).

21 The Joint Service Manual of the Law of Armed Conflict (2004). UK Ministry of Defense. Article 12.13.

22 In 1966, the delegation of France requested the General Assembly of the UN to incorporate the question relative to the definition and delimitation of the outer space to the agenda of the Legal Subcommittee of the UN Committee on the Peaceful Uses of Outer Space. Additionally, the General Assembly, in its resolution 38/80 of December 15th of 1983, disposed the Legal Subcommittee the creation of a working group in order to treat this topic as a priority. See more at: United Nations General Assembly, Committee on the Peaceful Uses of Outer Space, Legal Subcommittee. *Historical summary on the consideration of the question on the definition and delimitation of outer space: Report of the Secretariat*, A/AC.105/769 (2002). https://www.unoosa.org/pdf/reports/ac105/AC105_769E.pdf

23 United Nations General Assembly, Committee on the Peaceful Uses of Outer Space, Legal Subcommittee. *Historical summary on the consideration of the question on the definition and delimitation of outer space: Report of the Secretariat*, A/AC.105/769 (2002), par. 10-12. https://www.unoosa.org/pdf/reports/ac105/AC105_769E.pdf

c. Provide clarity to States and non-state actors in activities such as the positioning of satellites and suborbital flights.
d. Enable the enforcement of law, rules and regulations [may International Humanitarian Law be included][24].

In case a new binding instrument is created to regulate armed conflicts in outer space, the first point to solve would be its delimitation. It would not be substantial to reach a unanimous agreement about the scientific delineation of space; hence, the States could establish this limit guided by practical, technological, or even referential considerations. In this context, the Kármán Line could represent an adequate answer to this matter[25]. Until treaty law is created, the lack of regulation produces uncertainty as there is an enormous gray area in International Public Law regarding this topic. Consequently, it would represent a real challenge to any court to determine where outer space commences. Moreover, as there is no consensus between the States and the scientific community, neither in theory nor in practice, it would be impossible to determine the existence of customary norms.

2.2. Space Law

The United Nations Office for Outer Space Affairs (hereinafter UNOOSA) defines Space Law as "the body of law governing space-related activities"[26]. The definition provided by the UNOOSA is considerably wide, so it could be interpreted that Space Law not only regulates those activities that physically occur in the space but also those that are related to space activities in general. That interpretation is fundamental in order to frame certain activities that take place on Earth and could represent violations to Space Law such as the development of weapons of mass destruction meant to be put in orbit.

Space Law comprises instruments of International Public Law and internal norms of each State's legislation. In particular, International Space Law (hereinafter ISL) has been developing since half a century ago. The United Nations Committee on the Peaceful Uses of Outer Space (hereinafter COPUOS) played a protagonist role in the early years of ISL. In fact, the COPUOS,

24 United Nations General Assembly, Committee on the Peaceful Uses of Outer Space, Legal Subcommittee. *Report of the Legal Subcommittee on its fifty-eighth session, held in Vienna from 1 to 12 April 2019*, A/AC.105/1203 (2019), par. 88-92. https://www.unoosa.org/pdf/reports/ac105/AC105_769E.pdf

25 In the same report of the Legal Subcommittee of 2019, some States proposed a similar solution that is contained in paragraph 91: "The view was expressed that the rationale for a delimitation of outer space and airspace at **between 100 and 110 km above sea level** was based on comprehensive considerations including scientific, technical and physical characteristics, namely the atmospheric layers, aircraft altitude capacity, the perigee of the spacecraft and the Karman line" (emphasis added).

26 United Nations Office for Outer Space Affairs. *Space Law*, n.d. https://www.unoosa.org/oosa/en/ourwork/spacelaw/index.html (access: 07/02/2020).

along with its 67 State members, developed five core space law treaties that are known as the *corpus iuris spatialis*[27], which includes:

1. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (hereinafter Outer Space Treaty)[28].

2. Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space[29].

3. Convention on International Liability for Damage Caused by Space Objects[30].

4. Convention on Registration of Objects Launched into Outer Space[31].

5. Agreement Governing the Activities of States on the Moon and Other Celestial Bodies[32].

There are also five declarations of principles that were adopted by the General Assembly of the United Nations. Because of their nature, these instruments are soft law sources and, therefore, not binding. However, the aforementioned declarations are relevant as they regulate specific topics that are extremely relevant to space warfare such as the uses of satellites. These instruments include:

1. Declaration of Legal Principles Governing the Activities of States in the Exploration and Uses of Outer Space[33].

2. The Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting[34].

3. The Principles Relating to Remote Sensing of the Earth from Outer Space[35].

4. The Principles Relevant to the Use of Nuclear Power Sources in Outer Space[36].

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27 Schmitt, Michael N. "International Law and Operations in Space". *Max Planck Yearbook of the United Nations Law*. Volume 10 (2006), p. 100.
28 Adopted by the UN General Assembly in its resolution 2222 (XXI), opened for signature on 27 January 1967, entered into force on 10 October 1967.
29 Adopted by the UN General Assembly in its resolution 2345 (XXII), opened for signature on 22 April 1968, entered into force on 3 December 1968.
30 Adopted by the UN General Assembly in its resolution 2777 (XXVI), opened for signature on 29 March 1972, entered into force on 1 September 1972.
31 Adopted by the UN General Assembly in its resolution 3235 (XXIX), opened for signature on 14 January 1975, entered into force on 15 September 1976.
32 Adopted by the UN General Assembly in its resolution 34/68, opened for signature on 18 December 1979, entered into force on 11 July 1984.
33 Approved by the UN General Assembly resolution 1962 (XVIII) of 13 December 1963.
34 Approved by the UN General Assembly resolution 37/92 of 10 December 1982.
35 Approved by the UN General Assembly resolution 41/65 of 3 December 1986.
36 Approved by the UN General Assembly resolution 47/68 of 14 December 1992.

5. The Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries[37].

2.3. International Humanitarian Law

IHL is commonly referred to as the law of war (*ius in bello* in Latin) or the law of the armed conflicts, that is a more appropriate definition. IHL has two fundamental purposes: to limit the means and methods of war employed during hostilities (known as Hague Law) and to protect persons that are not, or not anymore, participating in hostilities (known as Geneva Law). Excluding specific rules related to implementation and processes of judgment, IHL has to be exclusively applied in armed conflict scenarios. IHL rules are scattered on conventional and customary sources.

3. Applicable Law

The military use of outer space shall be analyzed in two moments or scenarios (i) during peacetime; and (ii) during armed conflicts.

3.1. The Use of Outer Space in Peacetime

In this first stage, there are not hostilities taking place in outer space yet; therefore, there is not an armed conflict. As has been previously explained, IHL would not be applicable in this scenario. On the other hand, Space Law, through its treaties, would be in force. The main conventional rules regarding the military use of outer space may be resumed in:

1. Article III of the Outer Space Treaty that conditions space activities to the observation of International Law and the UN Charter and their peaceful purposes[38]. This article recognizes the applicability of the *ius ad bellum* or *ius contra bellum* regime (including its exceptions) that is detailed in the UN Charter.

2. Article IV of the Outer Space Treaty, that is considered the most relevant norm of International Spac e Law in relation to space warfare. In the first place, it prohibits the installation of nuclear weapons and any other kind of mass destruction weapons in outer space or celestial bodies. Furthermore, this article declares that the moon and other celestial bodies shall be

37 Approved by the UN General Assembly resolution 51/122 of 13 December 1996.
38 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (1967). Article 3.

used only for peaceful purposes; it is consequently forbidden to establish military bases and to test new weapons there[39].

3. Article VI of the Outer Space Treaty which declares that States shall bear international responsibility, not only for their official activities in outer space but also for the activities of their nationals[40].

4. Articles II, III, and IV of the Convention on International Liability for Damage Caused by Space Objects that regulate the responsibility of the States to repair, in case of producing damages, as a result of space activities[41].

5. Article II of the Convention on Registration of Objects Launched into Outer Space which prescribes that every space object launched shall be registered by the State and informed to the Secretary General of the UN[42].

So, in theory, the outer space shall be used only for peaceful purposes, and space activities shall observe International Law. Nevertheless, the following question arises: What if the aforementioned rules of International Space Law and *ius contra bellum* are broken and a State starts an armed conflict?

3.2. The Use of Outer Space in Armed Conflict Scenarios

In the second stage, where hostilities take place and the armed conflict has started, the question arises: Is IHL applicable in outer space?

It is necessary to make a disclaimer before going deeper into this matter. The objective of this paper is neither to promote, by any mean, nor to legitimize military use of outer space. In fact, the real goal of the paper is to analyze the legal frame applicable in case an armed conflict arises starting from the premise that it would be inconceivable that such actions could develop without any regulation. This comment is necessary because some scholars and even States consider that analyzing the possible application of IHL in outer space legitimizes this kind of warfare. For example, the Russian Federation has expressed:

> At present, the expert community is paying increased attention to the issues of the applicability of international humanitarian law to military space activities. Many institutions, including the specialized international intergovernmental organization of the United Nations system, show an interest in assessing the implications

39 *Eiusdem*. Article 4.

40 *Eiusdem*. Article 6. This article is particularly controversial as many interpretations are plausible. It is not clear what would happen if non-governmental entities produced damages in outer space without the control and authorization of the State or States where they are located.

41 Convention on International Liability for Damage Caused by Space Objects (1972). Articles 2-4.

42 Convention on Registration of Objects Launched into Outer Space (1976). Article 2.

> of this branch of international law for space activities. Generally speaking, the "popularization" of this topic is quite an ambiguous thing. The new research trend raises concern because, whichever way one looks at it, it encourages the perception that warfare in outer space is accepted as an eventuality[43].

The position that the Russian Federation maintains is extremely risky because it hinders the possibility that law anticipates possible scenarios where a lot of lives could be seriously compromised and even the stability of the international system could be broken.

Having made these clarifications, it will be proceeded to analyze the question that was already stated regarding the applicability of IHL in outer space. In 2015 the International Committee of the Red Cross (onwards ICRC), exposed a statement to the First Committee of the General Assembly of the United Nations stating:

> What is certain is that any hostile use of outer space in armed conflict –that is, any use of means and methods of warfare in, from, to or through outer space– must comply with IHL, in particular its rules of distinction, proportionality and precautions in attack[44].

The statement is categoric: when armed conflicts take place in outer space, the parties must comply with IHL. The ICRC emphasized that stating that IHL is applicable in outer space does not mean that space can be legally used for hostile purposes, because that would imply a violation of International Space Law and *ius ad bellum*. It is also interesting the way the ICRC provides a remarkably broad definition for the hostile use of outer space; in fact, following the statement, hostile acts could be conducted in, from, to or through space. It is appropriate to remember that the declaration of the ICRC is not legally binding if we follow article 38 of the Statute of the International Court of Justice[45]; however, it can be used as an auxiliary source as it constitutes specialized doctrine.

Additionally, the International Court of Justice (hereinafter ICJ), have implicitly expressed itself in favor of the applicability of IHL in outer space. In fact, in its Advisory Opinion of 1996 relative to the Legality of the Threat or Use of Nuclear Weapons, the court considered that IHL "applies to all forms of warfare and to all kinds of weapons, those of the past, those of the present and

43 Committee on the Peaceful Uses of Outer Space. *Survey of the problem of discretion exercised by States in interpreting basic legal principles and norms related to safety and security in outer space: Working paper submitted by the Russian Federation*. A/AC.105/2018/CRP.17 (2018), par. 21. https://www.unoosa.org/res/oosadoc/data/documents/2018/aac_1052018crp/aac_1052018crp_17_0_html/AC105_2018_CRP17E.pdf

44 International Committee of the Red Cross. *General debate on all disarmament and international security agenda items. United Nations, General Assembly, 70th session, First Committee, statement by the ICRC, New York, 15 October 2015*, 2015. https://www.icrc.org/en/document/weapons-icrc-statement-united-nations-2015 (access: 31/01/200).

45 Statute of the International Court of Justice (1945). Article 38.

those of the future"[46]. There is no doubt that space warfare would be covered in that definition. As well as the ICRC's statement, ICJ's Advisory Opinion constitutes an auxiliary source of International Law.

At this point, it is necessary to establish binding sources that lead to the same conclusion. Perhaps the best argument results from the interpretation of common article 1 to the Geneva Conventions of 1949 which prescribes: "The High Contracting Parties undertake to respect and to ensure respect for the present Convention in **all circumstances**" (emphasis added)[47]. The phrase "all circumstances" includes the territorial or physical scope of application of IHL; following this logic, the outer space cannot be excluded from IHL's frame. Dr. Dale Stephens, Editor in Chief of the Manual on International Law Applicable to Military Uses of Outer Space (MILAMOS), interprets this article stating that it "surely means the law applies wherever and whenever armed conflict occurs"[48].

Strong arguments may also be found in Additional Protocol I to the Geneva Conventions. In fact, article 1.2. states:

> In cases not covered by this Protocol or by other international agreements, civilians and combatants remain under the protection and authority of the principles of international law derived from established custom, from the principles of humanity and from the dictates of public conscience[49].

This is one of the many variations of the Marten's Clause. So, following its logic, in all scenarios that are not directly covered by the Protocol or even by the Geneva Conventions, the basic principles of International Public Law, international custom, and the basic principles of IHL shall be applied.

Another very strong argument, supported by a binding source, comes from article 3 of the Outer Space Treaty that conditions space activities to the observation of International Law[50]. As International Humanitarian Law is a branch of International Law, it is clear that is covered by the scope of article 3.

In conclusion, there are very strong arguments from both binding and non-binding sources of International Public Law that support the possibility and necessity to apply IHL in the case and armed conflict arises in outer space.

46 International Court of Justice. *Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons*, 1996, par.86.
47 The Geneva Conventions of 12 August 1949 (1949). Common Article 1.
48 Stephens, Dale. *Why Outer Space Matters. Dr. Dale Stephens gives a brief introduction to International Humanitarian Law*, 2016. https://intercrossblog.icrc.org/blog/twmzia1cp84kv2c29bi4iz6q4u03in (access: 21/01/2020).
49 Protocol Additional to the Geneva Conventions of August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), of 8 June 1977 (1977). Article 1.2.
50 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (1967). Article 3.

4. Challenges of IHL in Outer Space

Affirming that IHL is largely applicable in outer space does not solve the controversy at all. In fact, it is evident that IHL, as well as other branches of law such as Tax Law, Environmental Law, and Property Law, were created to be applied on Earth; therefore, many challenges arise.

4.1. Dual-Use Objects

Attacks directed to dual-use objects represent perhaps the most challenging issue of space warfare. Civilian objects are protected under International Humanitarian Law by specific conventional and customary rules that gather the essence of the principle of Distinction[51]. However, when those objects come to be used for military purposes, they lose that protection and become military objectives[52]. In those situations, such objects are usually known as dual-use objects. The problem is that the majority of satellites and other space objects that could be used for military purposes have also civilian purposes. The ICRC expressed its concern to the United Nations about the alarming possible consequences of attacking space dual-use objects; indicating:

> Attacks against such highly integrated "dual-use" systems through kinetic or non-kinetic means can entail significant humanitarian consequences for up to millions of civilians on the ground, for example by disrupting health-care and other essential services that depend on space-based communication systems[53].

About this topic, the Group of Governmental Experts on Further Practical Measures for the Prevention of an Arms Race in Outer Space conducted a study relative to the potential consequences of space warfare. The results were exposed in an inform called: Humanitarian Consequences and Constraints Under International Humanitarian Law (IHL) related to the Potential Use of Weapons in Outer Space. Among others, the most relevant consequences are[54]:

1. The destruction of communication systems.

2. Damages to health systems on Earth.

51 Protocol Additional to the Geneva Conventions of August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), of 8 June 1977 (1977). Article 52.

52 ICRC Customary IHL Database. Rule 10.

53 International Committee of the Red Cross. *General debate on all disarmament and international security agenda items. United Nations, General Assembly, 70th session, First Committee, statement by the ICRC, New York, 15 October 2015*, 2015. https://www.icrc.org/en/document/weapons-icrc-statement-united-nations-2015 (access: 31/01/200).

54 Group of Governmental Experts on Further Practical Measures for the Prevention of an Arms Race in Outer Space. *Humanitarian Consequences and Constraints Under International Humanitarian Law (IHL) related to the Potential Use of Weapons in Outer Space: Working paper submitted by the International Committee of the Red Cross (ICRC)*, GE-PAROS/2019/WP.1 (2019), par. 3.

3. Disaster prevention and mitigation would be affected if satellites are damaged.

4. Navigation systems would be damaged.

In these cases, the principle of proportionality must be observed. This principle is gathered in treaties such as the Additional Protocol I to the Geneva Conventions as well as customary law. Rule 14 of the ICRC's Customary IHL Database prescribes:

> Launching an attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated, is prohibited[55].

In fact, the principle of proportionality implies the duty of the attacking party to contrast civilian losses with the military advantage in every single attack. This principle is intimately related to the principle of military necessity; furthermore, attacks can be made only if the party pretends to obtain a direct and concrete military advantage from the attack.

There is a specific case where IHL regulates and establishes a higher standard of military necessity in order to protect cultural objects that could be used to establish an analogy in this case. That is the case of the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict that, in its article 4.2, prescribes that imperative military necessity is required in order to exceptionally attack the objects protected by the convention[56]. It is obvious that the Hague Convention establishes high standards in order to protect cultural objects because their damage would produce bigger consequences for humanity compared to the destruction of a common object. As the standard of imperative military necessity of the 1954 Hague Convention resulted ambiguous, its scope was clarified in article 6 of the Second Additional Protocol of 1999 which established a list of requisites in order to lawfully invoke imperative military necessity. Article 6 mandates:

> With the goal of ensuring respect for cultural property in accordance with Article 4 of the Convention:
> (a) a waiver on the basis of imperative military necessity pursuant to Article 4 paragraph 2 of the Convention may only be invoked to direct an act of hostility against cultural property when and for as long as:(i) that cultural property has, by its function, been made into a military objective; and (ii) **there is no feasible alternative available to obtain a similar military advantage to that offered by directing an act of hostility against that objective**;

55 ICRC Customary IHL Database. Rule 14.
56 Convention for the Protection of Cultural Property in the Event of Armed Conflict (1954). Article 4.

> (b) a waiver on the basis of imperative military necessity pursuant to Article 4 paragraph 2 of the Convention may only be invoked to use cultural property for purposes which are likely to expose it to destruction or damage when and for as long as no choice is possible between such use of the cultural property and another feasible method for obtaining a similar military advantage;
> (c) the decision to invoke imperative military necessity shall only be taken by an officer commanding a force the equivalent of a battalion in size or larger, or a force smaller in size where circumstances do not permit otherwise;
> (d) in case of an attack based on a decision taken in accordance with sub-paragraph (a), an effective advance warning shall be given whenever circumstances permit (emphasis added)[57].

As it can be noticed, the standard of imperative military necessity is very high. In the first place, it may be invoked just if there is not any other feasible way to obtain a similar military advantage; this means that the attack must be the last resource. Additionally, the article establishes requisites such as the need for a direct order from an officer that commands the force and the practice of an effective warning before the attack.

In case a new treaty is developed, the standard of imperative military necessity should be considered for any attack directed to space objects that are particularly vulnerable such as satellites. As it would be very difficult for the attacking party to determine the total civilian damage that could result from the attack to a satellite, the higher possible standard should be enforced.

4.2. Human Direct Participation

Space warfare can develop with or without direct or physical human participation in outer space. Those scenarios where humans directly participate in military operations in space suppose a real challenge to International Law. IHL counts with numerous provisions in order to regulate the treatment of prisoners of war and detainees, the treatment that shall be given to the corpses, the rights of the wounded to receive medical assistance, etc. Of course, these rules would be extremely difficult to observe if the armed conflict takes place in outer space; as a matter of fact, not only economic but also physical factors would prevent the parties to properly fulfill their obligations.

The regime applicable to the treatment of prisoners of war is principally gathered in the Third Geneva Convention. The parties, regarding their obligations with prisoners of war, have the duty to safely evacuate them[58], maintain them

57 Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict (1999). Article 6.
58 Geneva Convention Relative to the Treatment of Prisoners of War of 12 August 1949 (1949). Article 20.

far from zones exposed to military combat[59], assure their basic needs[60], let the prisoners receive shipments[61], etc. It is necessary to consider that it is unlikely that States could send crews capable of satisfying all the requirements of prisoners in outer space. Additionally, in space transports, there surely will not be enough space to maintain prisoners for a long time. Finally, it would be impossible to maintain them far from the combat zones.

Additional Protocol I and Customary Law state that the parties have the obligation to search for the persons that are reported missing in the context of armed conflict[62]. It would be inconceivable to pretend that a party could conduct a proper search in outer space. The parties have also the obligation to search and collect the remains of the dead taking all possible measures[63]. There are also many obligations in IHL regarding the treatment of the corpses and the celebration of proper burials taking all possible measures[64]. As we can see, these obligations have to be met considering a diligence standard and the resources available. It is evident that the obligations related to the treatment of prisoners of war, the missing and the dead, are much complicated to observe when armed conflicts develop in outer space. Therefore, the standard of diligence required from the belligerent party shall be far less strict. However, if that standard is accepted, it would imply that sending humans to combat in outer space should be an exceptional measure because those combatants would be really vulnerable in such scenarios.

Let us try to imagine a hypothetical scenario where soldiers are sent to outer space in the context of armed conflict. In 2180, the United Kingdom accidentally destroys a Chinese military satellite during a training session of the "Royal British Space Army". The satellite falls to Earth and the U.S. intelligent services collect the pieces and process all the national security information that they could gather. China considers the U.K.'s actions as acts of war. Therefore, China sends a military spaceship to outer space, with 70 soldiers and 9 crew members, in order to protect other Chinese satellites and manually disable satellites from the U.K. and the U.S. as a reprisal. Dismayed by the measures taken by China, the U.S. send their own spaceship to outer space, with 50 soldiers, and place it very close to the Chinese spacecraft. Tensions rise to the point that the U.S. crew decides to attack the Chinese ship with a laser weapon. Because of the attack, the Chinese ship suffers severe damage, 20 soldiers, as well as all crew members, die, and 40 other soldiers get seriously injured.

59 *Eiusdem.* Article 22.

60 *Eiusdem.* Articles 15 and 30.

61 *Eiusdem.* Article 72.

62 Protocol Additional to the Geneva Conventions of August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), of 8 June 1977 (1977). Article 33. See also: ICRC Customary IHL Database. Rule 117.

63 See Geneva Convention I, Art. 15(1); GC II, Art. 18(1); GC IV, Art. 16(2); ICRC Customary IHL Database, Rule 112. Additional Protocol I, Art. 33(4).

64 See Geneva Convention I, Art. 17; GC II, Art. 20; GC III, Art. 120(3)-(5); GC IV, Art. 130(1) and (2); ICRC Customary IHL Database, Rule 115.

After the attack, the U.S. sends a reconnaissance mission to the spaceship from China. Because of the capacity of the ship, U.S. soldiers were just able to capture 10 prisoners of war and to transport 10 wounded to the U.S. ship in order to provide medical treatment. It is evident that the U.S. would not be able to transport all the prisoners and the wounded to a safe place in case the conflict continues. It is also clear that the corpses would not be transported and properly buried. Furthermore, perhaps even basic needs would not be provided to the prisoners and the wounded would not receive appropriate medical treatment because of the lack of available resources. Finally, maybe a lot of survivors would have to be abandoned because of the lack of physical space on the ship. As it could be seen, very complicated situations could arise if humans directly take place in hostilities that take place in outer space. In such cases, States would be obligated to comply with their international obligations, depending on available resources, taking all possible measures. However, it is clear that such obligations would never be enough; therefore, human direct participation in armed conflicts that take place in outer space should be extremely restricted.

4.3. Development of New Weapons

Article IV of the Outer Space Treaty prescribes: "The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military maneuvers on celestial bodies shall be forbidden"[65]. Although the article prohibits the testing of new weapons in celestial bodies, there is not an express prohibition to test or develop new weapons in orbit, inside a space station, or any other space object. The same article prohibits the use of nuclear weapons and any other kind of mass destruction weapons in outer space, making it clear that they cannot be used in outer space.

For the rest of the weapons that could be developed in outer space, there is not a concrete answer. This is a gray area of IHL and generates an enormous debate nowadays. What is clear is that the same standards and rules applicable on Earth shall be applied in space. In this sense, Article 36 of Additional Protocol I to the Geneva Conventions states[66]:

> In the study, development, acquisition or adoption of a new weapon, means or method of warfare, a High Contracting Party is under an obligation to determine whether its employment would, in some or all circumstances, be prohibited by […] international law.

65 Adopted by the UN General Assembly in its resolution 2222 (XXI), opened for signature on 27 January 1967, entered into force on 10 October 1967.

66 Protocol Additional to the Geneva Conventions of August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), of 8 June 1977 (1977). Article 36.

Therefore, the parties to an armed conflict have the obligation to determine if the weapons that are being developed and may be used in the conflict would not contradict the rules and principles of IHL. Niles Melzer established a test in order to determine if a new weapon would be allowed by IHL. The test is constituted by 4 main points considering if the weapon:

1. would already be prohibited under a specific weapon treaty;
2. would constitute an indiscriminate weapon;
3. would be of a nature to cause superfluous injury or unnecessary suffering, or widespread, long-term and severe damage to the natural environment;
4. would contradict the "principles of humanity" or "public conscience" (Martens Clause)[67].

The test of Melzer considers the observance of conventional law, the principle of distinction, the principle of humanity, Additional Protocol I to the Geneva Conventions of 1949, and the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD) regulations regarding attacks to the natural environment and, finally[68], Marten's Clause.

The International Court of Justice in its Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons of 1996 analyzed the case of nuclear weapons and expressed its view about the development of new weapons in general. The court stated that Marten's Clause "had proved to be an effective mean of addressing the rapid evolution of military technology"[69]. In this Advisory Opinion, the ICJ analyzed the legality of nuclear weapons applying IHL principles of distinction and humanity. The Court determined that, although Nuclear Weapons are not conventionally prohibited, it would be extremely complicated that an attack employing them could fulfill IHL principles. The same standards should be observed when a new space weapon is developed.

5. The Path to a Treaty

Along the paper, many solutions have been proposed in order to regulate an hypothetical armed conflict in outer space. Those solutions have been mainly directed to the application of treaties, customary rules, and principles that already exist and are applied on Earth. However, as space warfare is unique

67 Melzer, Nils. *International Humanitarian Law: a Comprehensive Introduction*. Geneva: International Committee of the Red Cross, 2016, p. 122.

68 Article 35.3. of Additional Protocol I prescribes: "It is prohibited to employ methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment". By the other hand, Article 1 of the ENMOD Convention prescribes: "Each State Party to this Convention undertakes not to engage in military or any other hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State Party". As can be noticed, ENMOD provides broader protection to the natural environment as just one of the requisites is required. It is not clear if these dispositions in regard to the natural environment could be applied for outer space.

69 International Court of Justice. *Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons*, 1996, par. 78.

because of its nature, a lot of IHL rules result inapplicable or insufficient. The most effective solution to effectively regulate armed conflicts in outer space would require the creation of a specific treaty. However, currently, there is not a consensus between States in regard to many relevant topics such as the delimitation of outer space. Therefore, it would be prudent to consider that perhaps the best option at the moment would be to focus on developing non-binding instruments that could provide guidelines and principles. It would be expected that, with the passage of time, greater consensus could be achieved by States and then, and only then, the idea of a treaty would be generally accepted and, consequently the creation of a binding instrument would be viable.

This strategy has already been applied in several cases framed in the field of IHL. For example, by the initiative of Switzerland and the ICRC, in September of 2008 The Montreux Document on Pertinent International Legal Obligations and Good Practices for States related to Operations of Private Military and Security Companies during Armed Conflict was originally approved by just 17 States[70]. However, that number is continually growing. Likewise, in 2013 the Tallinn Manual on the International Law Applicable to Cyber Warfare was published. Both instruments cited are not binding but they serve as a useful source because they provide solutions and interpretation for two gray areas of IHL as cyberwarfare and private contractors.

In the 4th Manfred Lachs Conference on Conflicts in Space and the Rule of Law, the project to create the Manual on International Law Applicable to Military Uses of Outer Space (hereinafter MILAMOS) was launched by McGill University (Canada) and University of Adelaide (Australia)[71]. The project is also supported by the International Committee of the Red Cross and States like Canada[72]. The project pretends to: "draft a widely-accepted manual clarifying the rules applicable to the military use of outer space"[73]. The Manual will be divided into two parts: A and B. Part A will focus on military uses of space in a global security context that is relatively benign. On the other hand, part B will focus on military uses of space in situations posing threat to the peace, and the legal characterization of coercive or overtly hostile activities (use of force, *jus ad bellum*)[74]. MILAMOS project has created many expectations because it is being developed by remarkable experts in the field. Additionally, it seems like MILAMOS will be a very detailed instrument as it will cover a wide range of rules including:

70 The Montreux Document On pertinent international legal obligations and good practices for States related to operations of private military and security companies during armed conflict (2009).

71 McGill University. Launch of the *MILAMOS Project, 2016*. https://www.mcgill.ca/iasl/press/2016/milamos-launch (access: 09/04/2020).

72 *Ibíd.*

73 *Ibíd.*

74 McGill University. *Manual on International Law Applicable to Military Uses of Outer Space, Research*, n.d. https://www.mcgill.ca/milamos/research (access: 09/04/2020).

PART A	
Delimitation	UN Registration
Applicability of International Law	Jurisdiction and Control
Harmful Interference under Article IX of the Outer Space Treaty	Cooperation, Mutual Assistance and Due Regard
Responsibility for National Space Activities	Prior Consultation
Peaceful Purposes	Duty to Provide Information
Use of Electromagnetic Spectrum	Rescue and Return
Responsibility for Space Activities of International Organizations	Protection of the Natural Environment
Non-appropriation	Harmful Contamination
Weaponization	Status of Astronauts
National Registration	Freedom of Transit
Launching States	Military Maneuvers, Military Bases and Military Installations
Applicability of Space Treaties during Armed Conflict	Damage
Liability	Ground Infrastructure
Freedom of Use	Property Rights
Application of Domestic Laws	Space Operations
Space Objects	Technical Means of Verification
Astronauts and Space-related Persons	Orbital Rights
Weapons of Mass Destruction	National Space Activities
Launch and Ballistic Missiles	Applicability of International Law to International Organizations

<table>
<tr><th colspan="2">PART B</th></tr>
<tr><td>Harmful Interference and Intervention</td><td>Right of Self-Defense Against Armed Attack</td></tr>
<tr><td rowspan="5">Prohibition of Threat or Use of Force
Threat of Use of Force
Use of Force
Use of Force less than Armed Attack
Countermeasures</td><td>Security Council Resolutions/Collective Security</td></tr>
<tr><td>Humanitarian Intervention/R2P</td></tr>
<tr><td>Noncombatant Evacuations</td></tr>
<tr><td>Non-state Actors</td></tr>
<tr><td>Aggression[75]</td></tr>
</table>

75 Author's own graphic. Based on: McGill University. *Research*, n.d. https://www.mcgill.ca/milamos/research (access: 09/04/2020).

MILAMOS project may represent the first big step in order to regulate armed conflicts in outer space. As shown in the graphic, most of the topics that were addressed in the paper will be covered in the Manual including: space objects, delimitation, rescue and return operations, the status of astronauts, the applicability of IPL and IHL, etc. One of the weaknesses that could be identified in the Manual by just looking at its subtitles has to do with the fact that very controversial topics such as R2P will be covered. Indeed, covering this kind of issue could produce negative consequences such as the delegitimization of the project and the lack of cooperation from several States. It would be ideal if, with the basis of initiatives like MILAMOS project, the topic became popular on the international scene with a view to developing a binding treaty in the future.

6. Conclusions

Throughout the paper, some of the most concerning issues in relation to the possibility of applying the rules and principles of International Humanitarian Law, in the event that an armed conflict develops in outer space, have been exposed and analyzed.

The first critical problem is related to the lack of consensus among States, and even within the scientific community, in regard to the definition and delimitation of outer space. Although the aim to reach a consensus between the international community has been present in the debates of the competent organs of the United Nations (including the General Assembly and the Committee on the Peaceful Uses of Outer Space) since 1966, the progress that has been reached so far is very limited. The problem is that States use different approaches to determine the beginning of outer space based on scientific theoretical concepts, aerodynamic approaches, and even numbers based on their convenience. Perhaps the most feasible solution for this problem would be the consideration of the Kármán line as a unique standard. However, it is clear that everything depends on the goodwill of the States in order to reach a consensus and establish a uniform standard.

The key legal problem addressed by the paper tried to answer whether IHL would be applicable in outer space. The paper established two approaches: a theoretical or legal approach and a practical or empirical approach. The theoretical approach pretended to find legal arguments to support the thesis in favor of the applicability of IHL in outer space. Both binding and auxiliary sources of Public International Law were presented. The most relevant binding norms, that may lead to obtaining a favorable answer, are common article 1 to the Geneva Conventions of 1949, article 1.2 of the Additional Protocol I (and other expressions of the Martens Clause), and article 3 of the Outer

Space Treaty. Auxiliary sources, such as doctrinarian statements of the ICRC and advisory opinions of the ICJ, also support the same conclusions. Based on the arguments presented, it could be concluded that the existing legal frame is enough to affirm that IHL would be effectively applicable if an armed conflict developed in outer space.

However, affirming that IHL is theoretically or legally applicable is not enough in the sense that space warfare, because of its very unique nature, would present very challenging scenarios. The paper focuses on three of the most concerning gray areas —resulting from the application of IHL in outer space— including: (i) attacks on dual-use objects; (ii) the obligations of the parties to the conflict when there is human direct or physical participation; and (iii) the applicable regulations for the development and use of new weapons. The analysis of such situations gave as a result one general conclusion (applicable to the three cases) and some specific considerations. The general conclusion focuses on the need for a new specific treaty that regulates the area. On the first challenge, regarding the possibility of attacks directed at dual-use objects such as satellites, the importance of the principles of distinction and proportionality was considered. Additionally, the need to implement the imperative military necessity standard, that is used for the protection of cultural objects, or a similar regime was considered. On the second challenge, regarding the obligations of the States when there is direct human participation in hostilities, the main conclusion proposed that the standard of diligence required from the belligerent party shall be far less strict at the moment of obligations related with the treatment of the wounded, the management of corpses, etc. Finally, on the third challenge, regarding the development or use of new weapons, the general conclusion is that the same rules, principles, and considerations that are applied on Earth shall be considered in outer space.

Finally, the paper analyzed the possibility to create a new treaty that would specifically regulate space warfare. The general conclusion is categoric: as space warfare is unique because of its nature, plenty of IHL rules result inapplicable or insufficient. Therefore, a specific treaty is necessary in order to effectively fulfill the existing gaps. However, currently, there is not a consensus between States in regard to many relevant topics such as the delimitation of outer space so it would be prudent to create non-binding instruments, that may contain general guidelines or principles, in a first stage. In this context, the MILAMOS project was recognized as an interesting and remarkable first step in order to create a non-binding instrument that, with the passage of time, could contain rules and principles that may be considered in a new treaty in the future.

Frequently, the law arrives late. This means that law is codified or developed when a disaster or a conflict has already happened, and regrettable conse-

quences have to be faced. Therefore, it is a duty of the academy to start asking questions framed in hypothetical but probable scenarios with the aim to prevent its occurrence. The paper did not intend to legitimize the occurrence of armed conflicts in outer space but to provide possible solutions in case that one arises.